

Does non-interest income impact bank performance in emerging markets?  
The case of India

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Abstract

While research documents the increasing importance of non interest income for banks in developed countries, such research is lacking for emerging markets. We examine 95 Indian banks to study the relation between non interest income and bank financial performance in an emerging market. The average bank size and net income has doubled since the liberalization program of the early 1990s, while deposits and advances have increased approximately six-fold. We document that noninterest income is strongly influenced by bank size, ownership type, and managerial ability. Furthermore, bank ROE is significantly impacted by the amount of non interest income generated.

# **Does non-interest income impact bank performance in emerging markets? The case of India**

## **1. Introduction.**

India's financial liberalization policies of the early 1990s changed the banking landscape tremendously. These banking sector reforms were initiated with the intent of improving the operational efficiency of banks through deregulation of the interest rate environment, entry restrictions, and other banking practices. As a result, these reforms increased the competitive environment in which state-owned banks, private domestic, and foreign banks all jostle for a share of the market. As banks are increasingly squeezed in their pursuit of profitability, one strategy to increase income is to diversify away from traditional sources of revenue like loan making and toward activities that generate fee income, service charges, trading revenue, and other types of noninterest income. Motivated by the findings on the diversification benefits of non-interest income on U.S. and European banks, we examine the impact of non-interest income on the performance of Indian banks.

Our interest in this topic stems from two reasons. First, studies on U.S. commercial banks document that non-interest income rapidly grew to be a large part of banks' operating profits in the 1990s. For example, Stiroh (2004) reports that non-interest income accounted for 43% of U.S. commercial banks' net operating income, increasing from 25% in 1984. De Young and Rice (2004) report fairly similar figures in their study; 42% in 2001 compared to 20% in 1980. Further, they find that the increase in non-interest income as a percentage of total assets is much greater for big banks (79%) than for small banks (26%). This trend in non-interest income is also evident for

European banks (Chiarozza et al. (2007) and Mercieca et al. (2007)). However, the impact of non-interest income on bank returns and risk is not consistent across U.S. and European banks. Hence, the extent to which these findings can be generalized to other nations is limited at best. In addition, given the dearth of research on non-interest income trends for banks in emerging market countries, we are interested in determining whether non-interest income improves or worsens the risk return tradeoff for banks in emerging market countries. While research examines efficiencies in Indian banking (for example, Kumbhakar and Sarkar (2003), Sathye (2003), and Sensarma (2006)), research is lacking on the changing nature of non-interest income and its impact on bank performance. Our study of 95 Indian banks over the period 1997-2007 aims to fill this gap.

Our second interest in this topic derives from the research on bank ownership structures and profitability. Shleifer and Vishny (1997) provide an in-depth discussion of the case for and against state ownership. They suggest that publicly minded politicians can improve firm efficiencies by controlling the decisions of the firm. However, they find that in many instances, state owned firms do not serve the public's interest any better than privately owned firms. The empirical evidence on bank ownership structure and profitability is mixed. Altunbas et al. (2001) report private banks have cost and profit efficiency advantages over government banks, while Bonin, Hassan, and Wachtal (2004) find no significant evidence of profit efficiency between private and government owned banks; however, they find that foreign owned banks are more cost efficient than other banks. Given India's unique banking structure comprising of public sector banks, private sector (Indian), private sector (foreign), banks, our study analyzes the impact of non-interest income over different banking ownership structures. This is important as it

appears that the pursuit of non-income interest sources is especially relevant to some sectors; a recent survey (October 2007) finds that many public sector banks in India “to be lagging behind in their fee based income.” As the Indian economy grows at rapid pace (9.4% in 2006-2007), the opportunity for fee-based and other sources of non-interest income should increase, and the survey goes on to suggest that “initiating well-thought-out steps to enhance fee-based income may be essential for the banks.” This view echoes those of India’s central bank, The Reserve Bank of India (RBI), which urged banks to pursue non-interest income sources in its report on *Trend and Progress of Banking in India, 2002-03*. This report states that “the future profitability of public sector banks would depend on their ability to generate greater non-interest income and control operating expenses.”

However, the pursuit of non-interest sources of income is risky, and there is evidence that volatility increases as banks seek new non-interest sources. The RBI concedes that in a context where the government is also the owner, issues relating to bank profitability and risk give rise to a complex principal-agent situation with multiple objectives (The Hindu online, Nov. 17<sup>th</sup>, 2003). Thus, our study has policy implications for both the Indian market and for other emerging markets that are in a phase of liberalization and increased competitive forces in the market.

In this paper, we examine the trends in non-interest income in Indian banking and document the long term trends in the amount and composition of non-interest income in Indian banks. Furthermore, we discuss the regulatory and competitive determinants of noninterest income and consider possible reasons why it has grown more quickly in some

banks than at others. In doing so, we also examine the potential impact of the increase on non interest income on the financial performance of banks in India.

Our preliminary findings show that while non-interest income rapidly rose for Indian banks, the impact was different based on bank bank type. Figure 1 shows the trend in two categories – non-interest income to working funds and non-interest income to total assets. Foreign banks capture the largest share of non-interest income; for instance, non-interest income to working funds increases from 0.399% in 1999 to 3.38% in 2006. State-owned banks and domestic private banks both show increases in the ratios till the mid-2000s when it appears that their non-interest revenue shrinks slightly beginning in the mid-2000s.

Overall, we show that Indian banks are growing at a very fast pace since the liberalization of the early 1990s, and both interest income and non-interest income have risen over our sample period. We document that more efficiently run banks, as measured by ROE, generate more non-interest income, and less fee-based income. We find that loan quality, personalized customer service, and profit generated per employee to be significant drivers of non-interest income, while banks which pursue more traditional interest income sources tend to produce lower non-interest income. Thus, it appears that the two sources of income are viewed as substitutes and not complements in the Indian banking environment. Foreign banks capture the largest share of non-interest income, perhaps due to their competitive advantage in these business lines, followed by private domestic banks.

The remainder of the paper is as follows. In Section 2, we provide a brief survey of the literature, followed by a description of the regulatory and financial market changes

in India. We describe our data and empirical model in Section 3. The results are presented and discussed in Section 4, while Section 5 concludes the paper.

## **2.**

### **2.1. Literature Review**

While the diversification literature encompasses products and services diversification as well as geographical diversification, we discuss only the literature that relates to diversification into non-interest income sources. An increase in noninterest income is expected to improve earnings. It is expected that as non-interest income increases, banks may shift from traditional intermediation, thus resulting in decreases in interest income and simultaneous declines in credit and interest rate risk. Stiroh (2004) assesses the potential diversification benefits from the shift into non-interest income sources of bank revenue. He states that the increase in non-interest income in U.S. commercial banks has not only contributed to higher levels of bank revenue over time, but has also led to the belief that it can reduce the volatility of bank profits and can reduce risk. Using aggregate and individual level bank data from 1979 to 2001, Stiroh finds, on the aggregate level, while the volatility of bank revenue growth has indeed decreased in the 1990s, this is more due to the reduced volatility within net interest income growth than the diversification benefits of non-interest income growth. Furthermore, he finds the lines between non-interest income and interest income are increasingly blurred with the two sources of income growing highly correlated over time. He suggests that greater cross-selling expose multiple business segments to the same economic shock, thus mitigating any potential for diversification benefits. At the

individual bank level, Stiroh finds the same increased correlation between non-interest and interest income and notes that not only does the increased non-interest income negatively impact returns, but it also increases the bankruptcy potential. Stiroh and Rumble (2006) also note similar worsening of the risk return trade off for US banks stating that the earnings gains from diversification caused by growth in non-interest income is outweighed by the volatility increases, resulting in a non-commensurate increase in stock returns.

In a similar line of argument, DeYoung and Roland (2001), DeYoung and Rice (2004) note that non-interest income exists along with, rather than replaces interest income in U.S. commercial banks. The result of this expansion into fee based incomes, they note however may result in increased variability of profits alongside higher profitability and a worsened risk-return trade-off for banks. They also find that better managed banks tend to move more slowly into non-interest income sources.

While Stiroh (2004), De Young and Rice (2004), Stiroh and Rumble (2006) indicate a worse risk-return trade-off for U.S. commercial banks venturing into non-interest income sources of revenues, similar studies on non-interest income for European banks provide somewhat different results. Chiarozza et al. (2007) show that income diversification increases risk-adjusted returns. They find that diversification gains from non-interest income diminish with bank size; small banks with very small non-interest income shares record the most significant gains. Examining the diversification benefits of non-interest income in banks in 15 European countries, Staikorous and Wood (2003) find a negative correlation between non-interest income and interest income. They conclude that, unlike the case in U.S. commercial banks, non-interest income tends to

stabilize bank earnings in European banks. Baele et al. (2007) examine European banks to over the period 1989-2004 to find that non-interest income increases bank franchise value positively. They also find that banks that have higher non-interest income have higher market betas and therefore higher systematic risk.

Merceica et al. (2007) examine the diversification benefits on small European banks for the period 1997-2003. They find no direct diversification benefits within and across business lines, and interestingly, find an inverse relation between non-interest income and bank performance. Lepetit et al (2008) investigate 602 European commercial banks and cooperatives to assess how the banks' expansion into fee-based services impact their interest margins and loan pricing. They find that banks with greater fee-based services charge lower lending rates; borrower default risk is underpriced in banks with greater fee-based services. The authors suggest that banks may use loans as a loss leader, raising issues of increased risk when banks use cross-selling strategies. They suggest that their finding may help explain the positive relation found between risk and product diversification found in earlier studies such as DeYoung and Rice (2004) and Stiroh (2004).

Overall, the literature surveyed above provides significant evidence of the differing influence of non-interest income on U.S. versus European banks. The transportability of the results to the emerging markets still remains an empirical question given the inconsistencies in these patterns evidenced in the western continents. Bank size and management quality appear to be a significant drivers of such profitability. These findings, along with the studies on government ownership and profitability, motivate us to examine Indian banks in the context of non-interest income and bank performance.

## **2.2. Regulatory background of Indian banking.**

The banking system in India is complex in that it comprises public and private firms with the latter including foreign firms. As in many other emerging economies, India until recently was heavily regulated with the banking sector aligned to meet social and economic development. Early in the development of banking in India, a two-phased nationalization of banks was carried out with the aim of equalizing banking access to all areas and segments of society. These included establishment of lending targets to priority sectors, provision of refinancing facilities, credit guarantee schemes, branching of banks to rural and select urban areas among others. The RBI further controlled deposit rates on savings and time deposits and specified differential lending rates linked to borrowers' incomes and types of lending. The majority of lending and deposit taking was done by the public sector banks till the early 1990s. The net effect of these controls was an inefficient allocation of resources.

The inefficiencies that stemmed from these banks included poor customer service, high non-performing assets, low capitalization and low profits. As a corrective measure, in 1991-92, the first set of recommendations was launched to overhaul the banking system in India. The reforms were focused on increasing efficiencies and soundness of the banking sector. The RBI initiated liberalization measures to create increased banks to move toward a market driven financial system. Some of these reforms include adoption of capital adequacy in line with international norms, assets classification and provisioning, deregulation of interest rates, lowering of Statutory Liquidity Ratio (SLR) and Cash Reserve Ratio (CRR), opening of the sector to private participation, permission

to foreign banks to expand their operations through subsidiaries, the introduction of Real Time Gross Settlement (RTGS) and liberalization of foreign direct investment (FDI) norms.

The institutional structure of the financial system is characterized by (a) banks, either owned by the Government, RBI or private sector (domestic or foreign) and regulated by the RBI; (b) development financial institutions and refinancing institutions, set up either by a separate statute or under Companies Act, either owned by Government, RBI, private or other development financial institutions and regulated by the RBI; and (c) non-bank financial companies (NBFCs), owned privately and regulated by the RBI. The legislative framework governing public sector banks (PSBs) was amended in 1994 to enable them to raise capital funds from the market by way of public issue of shares. Many public sector banks have accessed the markets since then to meet the increasing capital requirements. As late as FY 2001-02, the government made capital injections out of the budget to public sector banks. Since then, the move has been to reduce the government ownership in nationalized banks from 51 to 33 percent, keeping the public sector goal in place.

Reforms have altered the organizational forms, ownership pattern, and domain of operations of financial institutions. The drying up of low cost funds has led to an intensification of the competition and increased demand for resources for both banks and financial institutions. Simultaneously, banks have entered into term lending and financial institutions have begun disbursing short-term loans, thus changing the competitive arena on the supply of funds as well. In addition, financial institutions have also entered into various fee-based services like stock-broking, merchant banking, advisory services and

the like<sup>1</sup>. Additionally, while presently RBI holds shares in a number of institutions, the intent is to divest RBI of all its ownership functions.

Steps have also been initiated to infuse competition into the financial system. The RBI issued guidelines in 1993 to increase the establishment of new banks in the private sector. Likewise, foreign banks have been given more liberal entry. The Union Budget 2002-03 has also provided a boost to the foreign banking segment, permitting these banks, depending on their size, strategies and objectives, to choose to operate either as branches of their overseas parent, or, corporatize as domestic companies. This is expected to impart greater flexibility in their operations and provide them with a level-playing field vis-à-vis their domestic counterparts.

Another major element of financial sector reforms in India has been focused on ensuring safety and soundness through greater transparency, accountability and public credibility. Capital adequacy norms for banks are in line with the Basel Committee standards and from the end of March 2000, the prescribed ratio has been raised to 9 per cent. The focus is to gradually move close to the international standards and reforms have kept abreast of Basle II adjustments as well.

### **3. Data and Empirical Model**

The Indian industry has seen a move toward market driven allocation of funds coupled with the deepening of the financial markets, thus providing a greater scope for

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<sup>1</sup> The Reserve Bank has enunciated that in processing specific proposals for the movement towards universal banking from concerned institutions, the overwhelming consideration would be to meet the strategic objectives of the concerned financial institution for meeting the varied needs of different categories of customers, while at the same time, ensuring healthy competition in the financial system through transparent and equitable regulatory framework applicable to all participants in the banking business. In such a situation, particular attention would be paid to the primary need to ensure safety of public deposits, especially of small depositors, and to promote the continued stability of the financial system as a whole, and of the banking system, in particular.

banks to expand their activities away from traditional intermediation. The available evidence from US and Europe largely indicates some relationship between non interest income and financial performance. We shall examine this in the next sections of the paper in the Indian banking context.

### **3.1. Data**

We obtain our initial sample from the RBI database, and augment this data with the Center for Monitoring the Indian Economy's (CMIE) Prowess database. We include only state-owned, private domestic, and private foreign banks in our sample, eliminating cooperatives and other state commercial enterprise banks. Our final sample comprises of 95 banks spanning the period 1997-2007 which includes public sector banks, private domestic banks, and private foreign banks.

The Prowess database classifies income in two ways. The first definition of income divides income into interest income and non-interest income. Interest on advances (loans) and investment activities is classified as interest income, while non-interest income comprises income from sources excluding the interest earned on advances, deposits with the RBI, and deposits with other banks. Therefore, non-interest income comprises profit on trading, gains from foreign exchange activity, income from fiduciary activities, fees and commissions for services related to issuing letters of credit, syndication, underwriting, derivatives transactions, etc. In the second definition of income, the Prowess database also provides information on the fee-based and fund-based income for each bank. Fund-based income includes interest received on advances and investments, income earned through activities such as leasing, hire-purchase, and bill

discounting, while fee-based income includes fees and commissions on the services offered by the bank in instances when bank funds are not used. Thus, interest income is one component of a bank's fund based income.

We use several proxies as a measure of non-interest income; non-interest income to working funds, non-interest income to total assets, and fee-based income to total assets. This allows us to measure not only the total impact of non-interest income, but also the impact of its different components. We also use two burden measures in our analyses. Burden to total assets and burden to interest income allow us to examine how overhead and other expenses impact bank performance. The Indian banks define burden as Non-interest Expense minus Non-interest Income, and thus, unlike U.S. banks, this burden is reported as a positive value. In addition, we gather information on size (total assets), Return on Equity (ROE), business per employee, profit per employee, ratio of interest income to total assets, ratio of net non-performing advances to total advances, total advances to total assets, ratio of priority sector advances to total advances, and capital adequacy ratio for our sample of banks. We gather fund-based and fee-based information from the CMIE database, while the other variables are from the RBI database.

Similar to De Young and Rice (2004), we calculate a variable, employee deposits, which is a ratio of full-time employees to total deposits. This variable should be a proxy for personalized service. Finally, to capture the annual growth in deposits and advances, we calculate two variables; deposit growth and advances growth.

Tables 1 through 3 present data on trends and composition on incomes. Table 1 shows Fee based income and Fund based income have been increasing over the FY 1997-

2007 period. This may indicate that non-traditional intermediation is on the rise in India while the traditional lending and investment may still have a strong-hold in the banking business. An examination of the ratio of non-interest income to working funds, and the ratio of interest income to working funds shows that these variables increase steadily through the mid-2000s, after which they decrease slightly.

[Insert Table 1 here]

Table 2 presents the breakdown of non-interest income by bank type. The trend for non-interest income shows a steady increase over time, again through the mid-2000s, after which both non-interest income to total assets and non-interest income to working funds show a small decline. It appears that the increase in non-interest income is the greatest for foreign banks, followed by domestic banks.

[Insert Table 2 here]

Table 3 presents income distribution over the FY 1997-2007 by type of bank ownership. We note that public sector banks, overall, have the largest share of incomes; foreign banks do slightly better than domestic banks. However, examining the ratio of non-interest income to working funds, it seems that private domestic banks are more efficient than the other two groups. All the different types of ownership appear to receive most of their incomes from Fund based incomes followed by Fee based income.

[Insert Table 3 here]

[Insert Table 4 here]

Results presented in Table 4 indicate that banks in India are on average 40-50 years old with 5,000 to 6,000 employees and approximately 350 branches. Both

employees and branches have remained steady with slight upward shifts over time. Average asset size of banks has nearly tripled in size over the decade after liberalization. During the same ten year period of 1997-2006, average deposits and average advances of banks overall has grown six-fold indicating that as the economy in India is growing, banks are still increasing their traditional intermediation with loans and deposits. Overall, the Indian banking system shows a healthy growth for the post-liberalization period.

Private foreign banks are the youngest and follow with slightly higher number of branches. Private domestic banks have on average are almost double the size of the former based on asset size. This may indicate asset inefficiencies in private domestic banks. This is further exacerbated in comparing these two groups' average number of employees. In the private domestic banks, the average number of employees is 12 times that in the private foreign banks. Private domestic banks are the oldest banks even compared to state owned banks. State owned banks have the largest number of employees and branches as well as asset size.

### 3.2. Empirical model.

To further investigate the relation between non-interest income and bank characteristics, we use the following econometric model.

$$\text{Non-interest income}_{t,i} = \alpha + \beta_1(\text{return on equity}_{t,i}) + \beta_2(\text{ln assets}_{t,i}) + \beta_3(\text{business per employee}) + \beta_4(\text{profit per employee}_{t,i}) + \beta_5(\text{ratio of net nonperforming advances to total advances}_{t,i}) + \beta_6(\text{empdeposits}_{t,i}) + \beta_7(\text{ratio of priority advances to total advances}_{t,i}) + \beta_8(\text{capital adequacy ratio}_{t,i}) + \beta_9(\text{private domestic}_{t,i}) + \beta_{10}(\text{private sector foreign}_{t,i}) + \beta_{11}(\text{advance growth}_{t,i}) + \beta_{12}(\text{ratio of interest income to total assets}_{t,i}) + \beta_{13}(\text{advances to total assets}_{t,i}) \dots \dots \dots (1)$$

We define non-interest income<sub>t,i</sub> as follows and present it as four separate regressions.

- Non-interest Income to Working Funds
- Non-interest Income to Total Assets
- Fee based Income to Total Assets

The first regression allows us to identify specific bank characteristics that are associated with the different definitions of non-interest income. Research suggests (De Young and Rice (2004)) that well managed banks, as measured by return on equity, should generate lower amounts of non-interest income, while larger banks (ln assets) should generate greater non-interest income. We expect a positive relation between profit per employee and non-interest income, as higher profit should translate to both interest and non-interest income. We expect that as loan quality (net non-performing advances to total assets) decreases, the bank would presumably seek to replace interest revenue with non-interest income sources. We also expect a positive relation between the employee to deposits ratio and non-interest income, as bank customers should be willing to pay more in order to receive more personal, relationship-based services. On the other hand, banks with higher priority sector advances may be less inclined to venture into non-interest income avenues, therefore, we expect a negative relation here. Banks with higher capital adequacy ratios may be more willing to diversify into non-traditional revenue sources.

We also predict that ownership type will be a significant determinant of non-interest income. It would be logical that, given their competitive advantage in non-traditional banking, private foreign banks would generate significant levels of non-interest revenue sources. We use dummies for private domestic and private foreign banks to capture the ownership affect. Finally, given that advances growth, interest income to

total assets, and advances to total assets may be driven by the same factors, we provide four different iterations of the model above, allowing the variables to enter separately in three estimations. We predict a negative sign if non-interest income is primarily driven by the lack of traditional interest income sources, However, if banks experience a complementary effect, where non-interest income grows along with interest income via a growth in advances, we should report a positive sign on these variables.

In our next set of regressions, we examine the impact of bank characteristics on bank burden:

$$\text{Burden}_{t,i} = \alpha + \beta_1(\text{return on equity}_{t,i}) + \beta_2(\text{ln assets}_{t,i}) + \beta_3(\text{busiss per employee}_{t,i}) + \beta_4(\text{profit per employee}_{t,i}) + \beta_5(\text{ratio of net non performing advances}\sim\text{s}_{t,i}) + \beta_6(\text{emp deposits}_{t,i}) + \beta_7(\text{private domestic}_{t,i}) + \beta_8(\text{private foreign}_{t,i}) \dots\dots\dots(2)$$

We use two burden measures; burden to total assets and burden to interest income.

#### 4. Preliminary Results and Discussion

We present the results of the cross sectional estimations in Tables 5 and 6. Our first estimation uses non-interest income to working funds as the proxy.

[Insert Table 5a here]

As mentioned earlier, we use three different related variables of loan growth in our first three estimations. We had predicted that efficiently run banks, as measured by return on equity, may not find it necessary to pursue non-interest revenue sources. Our results show that this is not the case, and ROE is a significant driver on non-interest income. Thus, it appears that the more efficient banks pursue such diversification strategies. We also find that efficient banks, as measured by profit per employee claim a bigger stake of non-interest income. Similarly, banks with poor loan quality, as assessed by net non

performing advances to total advances, seek non-interest sources of income. Larger banks are marginally associated with increased non-interest income. Interestingly, the employee to deposit ratio, which is a measure of how much bank customers are willing to pay for personalized services is both highly statistically and economically significant in determining non-interest income.

We find that business per employee to be negatively related to non-interest income; thus as employees pursue new business sources, these sources appear to be the more traditional, interest based sources. At banks where employees spend more time pursuing these business lines, there appears to be less emphasis on diversifying out into non-interest income sources. Again, as we predicted, an increase in priority sector lending leads to declines in non-interest revenue. In terms of bank ownership, we find, again as we posited earlier, that dummy for foreign banks is significantly positive in determining the amount of non-interest income generated. We find that private domestic banks are marginally associated with higher non-interest income. We had hypothesized that as banks pursue more traditional interest income sources, they may not be as interested in non-interest revenue. As mentioned earlier, we measure this by advances, interest income, and growth in advances. We find that as interest income to total assets increases (Regression 2 in Table 5a), non-interest income is negatively impacted.

We find our results to be qualitatively the same when noninterest income ratio is defined as non interest income to total Assets in our second regression (Table 5b). Profit per employee, loan quality, and the employee to deposit ratio are significant drivers of non-interest income increases, while banks where the emphasis remains on traditional sources, as measured by business per employee, priority sector advances, and interest

income to total assets, report lower amounts of non-interest income. ROE is not significantly associated with non-interest income sources in this specification for non-interest income. Again, only foreign banks are significant drivers of non-interest income.

[Insert Table 5b here]

When non interest income is defined as fee based income, we note bank size is marginally significant in some of our estimations. Larger banks may be better positioned to capture the type of clientele who are willing to pay for fee based services.

[Insert Table 5c here]

Again, we find that profit per employee is positively related to fee-based income, while business per employee has a negative impact. Interestingly, we find a negative relation between ROE and fee based income, indicating perhaps that better managed banks may not be willing to pursue fee-based services. Unlike the results reported in Tables 5a and 5b, we also find that loan quality has a negative impact on fee based income, indicating that fee income increases as loan quality worsens. This result is not surprising since fee income comprises service charges on delinquent accounts. Once again, employee to deposits significantly increases fee income, indicating once again that customers are willing to pay for service. Bank ownership is also positively related to fee based income for both foreign and domestic banks. Again, interest income to total assets is negatively related to fee income.

Taken together our results indicate that banks with higher interest income to total asset ratios and higher employee productivity in deposit related areas report lower non-interest income. Thus, it appears that non-interest diversification exists as a substitute

and not a complement to the traditional income sources. We find that bank customers are willing to pay more for personalized services from employees, and that loan quality is negative driver of non-interest revenue. Foreign banks are able to best capture non-interest revenue, followed by private banks.

Our next set of regressions examines the impact of bank burden on bank performance. We use two ratios, burden to total assets and burden to interest income.

[Insert Table 5d here]

In regression one in Table 5d, we find that burden to total assets is negatively impacted by ROE and profit per employee, and positively related to business per employee, and the employee to deposits ratio. It seems that this ratio is also marginally increased if the bank ownership type is government.

Regression two of Table 5d reports the results for burden to interest income. Again, we find a positive relation between measures of labor productivity such as business per employee and the employee to deposits ratio. Burden to interest income is negatively impacted by profit per employee and if bank is foreign-owned.

## **5. Conclusion.**

While several studies examine the impact of non-interest income on bank performance for the U.S. and other developed countries, there remains a gap in research for emerging markets. Yet, many emerging markets present unique banking structures where former state-owned banks are gaining more independence as these countries

privatize many of their sectors. Thus, we examine the changing nature of non-interest income and its impact on bank performance for the post liberalization period in India. Our analysis covers 95 banks for the period 1997-2007.

Our preliminary results indicate that non-interest income is strongly and positively influenced by return on equity, loan quality, profit per employee, and personalized customer service offered to bank customers. We find that foreign banks capture larger amounts of non-interest income. Furthermore, we find that as banks continue to develop traditional interest income sources, they tend to diversify less into non-traditional sources of income, and we find that banks where employees generate more traditional business report significantly lower non-interest revenue

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Table1: Composition of Non-Interest and Interest Income, 1997-2007

This table reports the descriptive statistics on the composition of interest income and non-interest income for 95 Indian banks for the period 1997-2007. Data are from the Center for Monitoring the Indian Economy (CMIE) and the Reserve Bank of India (RBI).

<b>Year</b>	<b>Income interest to working funds</b>	<b>Fee based income</b>	<b>Fund based income</b>	<b>Non-interest income</b>	<b>Non-interest income to working funds</b>	<b>Burden to total assets</b>	<b>Burden to interest income</b>
1997	0.54	48.6	658.0	253.9	0.1	-	-
1998	1.64	50.1	701.2	278.9	0.37	-	-
1999	2.32	60.1	845.0	280.7	0.36	1.50	17.65
2000	6.02	75.8	1079.4	269.9	1.08	0.97	8.06
2001	7.87	81.6	1269.1	288.5	1.48	1.13	11.76
2002	7.34	75.3	1230.1	302.3	1.75	0.44	8.70
2003	7.43	76.2	1191.2	319.5	1.73	0.42	4.07
2004	6.69	84.8	1200.2	383.8	1.82	0.03	-3.25
2005	6.16	110.6	1229.4	282.2	1.29	0.60	4.56
2006	12.86	142.2	1536.5	286.5	1.47	0.63	7.50
2007	-	-	-	-	-	0.66	8.30
Average All years	5.77	80.1	1086.4	295.6	1.14	0.73	7.70

Table 2: Trends in Non Interest Income by Bank, 1997-2007

This table reports the descriptive statistics on the composition of non-interest income by bank type for 95 Indian banks for the period 1997-2007. Data are from the Center for Monitoring the Indian Economy (CMIE) and the Reserve Bank of India (RBI). NII is Non Interest Income and OI is Operating Income.

Year	Non Interest Income to Working Funds			Burden to Total Assets			Non Interest Income to Total Assets		
	Govt. Banks	Private Dom Banks	Private For. Banks	Govt. Banks	Private Dom Banks	Private Foreign Banks	Govt. Banks	Private Dom Banks	Private Foreign Banks
1999	0.294	0.943	0.399	1.66	0.975	1.813	1.286	1.54	2.638
2000	1.164	1.36	1.937	1.381	0.483	1.088	1.43	1.854	2.622
2001	1.327	1.477	2.777	1.635	0.861	1.009	1.323	1.42	2.432
2002	1.661	2.824	3.043	0.853	-0.214	0.653	1.687	2.491	2.527
2003	1.94	2.633	2.714	0.574	-0.073	0.691	1.9	2.412	2.401
2004	2.273	2.271	2.917	0.238	0.212	-0.29	2.166	2.194	2.899
2005	1.469	1.17	2.701	0.817	1.318	-0.232	1.466	1.136	2.985
2006	1.146	1.327	3.38	1.118	1.441	-0.583	1.058	1.167	3.496
All years				1.03	0.68	0.544	1.47	1.72	2.77

Table 3: Composition of Incomes by Type of Ownership

This table reports the descriptive statistics on the composition of non-interest income by bank type by bank type for the period 1997-2006. Data are from the Center for Monitoring the Indian Economy (CMIE).

<b>Type of Owner</b>	<b>Income interest to working funds</b>	<b>Fee based income</b>	<b>Fund based income</b>	<b>Non-interest income</b>	<b>Burden to total assets</b>	<b>Burden to interest income</b>
Private Foreign	6.78	53.15	313.90	194.23	0.54	4.41
Private Domestic	8.17	52.67	661.39	175.76	0.68	8.08
State Owned	7.70	271.33	3892.12	889.39	1.03	11.66

Table 4: Bank Characteristics

This table reports the descriptive statistics on bank characteristics period 1997-2006. Data are from the Center for Monitoring the Indian Economy (CMIE).

Panel A: By year						
Year	Average age	Average number of employees	Average number of branches	Average Assets	Average Deposits	Average Advances
	#	#	#	\$	\$	\$
1998	42.8	5,336.40	319.7	6,762.40	4,431.40	2,979.90
1999	43.6	5,286.80	350.2	7,814.20	5,477.60	3,637.50
2000	44.6	6,009.60	316.7	10,588.30	7,245.00	4,905.10
2001	45.6	6,460.50	376.1	12,860.30	8,903.40	5,859.70
2002	46.6	6,441.60	396.3	14,323.10	9,421.30	5,969.80
2003	47.6	5,797.00	358.7	14,616.40	9,489.70	6,016.50
2004	48.6	5,398.50	338.4	14,793.20	10,700.00	6,782.40
2005	49.6	5,863.50	61.1	17,403.10	12,810.80	8,827.00
2006	50.5	6,147.40	403.1	21,431.50	16,506.40	12,496.10
Total	46.6	5,832.70	356.9	12,642.30	8,846.40	5,975.60
Panel B: By type of Owner						
Type of Owner	Average age	Average number of employees	Average number of branches	Average Assets	Average Advances	Average Deposits
	#	#	#	\$	\$	\$
Private Domestic	53.9	6,775.90	441.3	12,082.30	5,943.90	10,839.70
Private Foreign	35	563.6	23.5	6,772.40	3,501.30	4,083.80
State owned	44.5	11,230.70	662.7	20,909.10	9,962.40	14,273.30

**Table 5a: Regression on Non Interest Income to Working funds**

Non-interest income<sub>t,i</sub> =  $\alpha + \beta_1(\text{return on equity}_{t,i}) + \beta_2(\text{ln assets}_{t,i}) + \beta_3(\text{business per employee}) + \beta_4(\text{profit per employee}_{t,i}) + \beta_5(\text{ratio of net nonperforming advances to total advances}_{t,i}) + \beta_6(\text{empdeposits}_{t,i}) + \beta_7(\text{ratio of priority advances to total advances}_{t,i}) + \beta_8(\text{capital adequacy ratio}_{t,i}) + \beta_9(\text{private domestic}_{t,i}) + \beta_{10}(\text{private sector foreign}_{t,i}) + \beta_{11}(\text{advance growth}_{t,i}) + \beta_{12}(\text{ratio of interest income to total assets}_{t,i}) + \beta_{13}(\text{advances to total assets}_{t,i})$

<b>Dependent Variable: Non Interest Income to Working Funds</b>	<b>Regression 1</b>	<b>Regression 2</b>	<b>Regression 3</b>	<b>Regression 4</b>
return on equity	0.0137***	0.0160***	0.0095**	0.0184***
lnassets	0.1552*	0.1141	0.2873***	0.0663
business per employee	-0.0019***	-0.0017***	-0.0018***	-0.0018***
Profit per employee	0.0416***	0.0384***	0.0407***	0.0393***
ratio of net nonperforming advances to total advance	0.0319***	0.0259***	0.0263***	0.0302***
Employee to deposits	-87.4662***	-73.2115***	-1.20E+02***	-53.0725**
ratio of priority advances to total advances	-0.0127**	-0.0198***	-0.0176***	-0.0147***
Capital adequacy	-0.005	-0.0036	0.0073*	-0.0124***
Private domestic	0.5464*	0.5471*	0.7095**	0.4731
Private foreign	2.0395***	1.6230***	1.8514***	1.8240***
Advances growth	0.0733			0.1099
ratio of interest income to total assets		-0.2174***		-0.1645***
advances to total assets			-0.5628	-0.5594
Constant	0.4147	2.9235**	-1.0449	3.2274**
N	505	594	594	505

Source: CMIE, RBI

Table 5b: Regression on Non Interest Income to Total Assets

$$NIIRatio_{t,i} = \alpha + \beta_1(\text{returnoneq}_{t,i}) + \beta_2(\text{lnassets}_{t,i}) + \beta_3(\text{busisspere}_{t,i}) + \beta_4(\text{profitpere}_{t,i}) + \beta_5(\text{ratioofnp}_{t,i}) + \beta_6(\text{empdeposits}_{t,i}) + \beta_7(\text{ratioofpri}_{t,i}) + \beta_8(\text{capitalade}_{t,i}) + \beta_9(\text{private domestic}_{t,i}) + \beta_{10}(\text{private foreign}_{t,i}) + \beta_{11}(\text{advancegro}_{t,i}) + \beta_{12}(\text{ratioofint}_{t,i}) + \beta_{13}(\text{advancesta}_{t,i})$$

Dependent Variable: NonInterest Income to Total Assets	Regression 1	Regression 2	Regression 3	Regression 4
return on equity	0.0008	0.0036	0.0025	0.0022
lnassets	0.1511*	0.0015	0.1047	0.1052
business per employee	-0.0006***	-0.0005***	-0.0005***	-0.0005***
Profit per employee	0.0106***	0.0104***	0.0099***	0.0105***
ratio of net nonperforming advances to total advance	0.0194***	0.0162**	0.0128*	0.0197**
Employee to deposits	16.6146***	12.9687**	11.3259**	15.7406***
ratio of priority advances to total advances	-0.0163***	-0.0164***	-0.0157***	-0.0156***
Capital adequacy	0.0137***	0.0056*	0.0080**	0.0095**
Private domestic	0.5623	0.3453	0.5123	0.4953
Private foreign	1.5226***	1.1956***	1.4864***	1.3424***
Advances growth	-0.0002			0.0002
ratio of interest income to total assets		-0.0799***		-0.0827**
advances to total assets			-0.5779	-1.0571*
Constant	-0.4442	2.5390*	0.5468	1.455
N	666	780	780	666

Source: CMIE, RBI

Table 5c: Regression on Fee Based Income to Total Assets

$$\text{FBIRatio}_{t,i} = \alpha + \beta_1(\text{return on equity}_{t,i}) + \beta_2(\ln \text{assets}_{t,i}) + \beta_3(\text{business per employee}_{t,i}) + \beta_4(\text{profit per employee}_{t,i}) + \beta_5(\text{ratio of net nonperforming advances to total advance}_{t,i}) + \beta_6(\text{employee to deposits}_{t,i}) + \beta_7(\text{ratio of priority advances to total advances}_{t,i}) + \beta_8(\text{capital adequacy}_{t,i}) + \beta_9(\text{private domestic}_{t,i}) + \beta_{10}(\text{private foreign}_{t,i}) + \beta_{11}(\text{advances growth}_{t,i}) + \beta_{12}(\text{ratio of interest income to total assets}_{t,i}) + \beta_{13}(\text{advances to total assets}_{t,i})$$

Dependent Variable: Fee Based Income to Total Assets	Regression 1	Regression 2	Regression 3	Regression 4
return on equity	-0.0001***	-0.0001***	-0.0001***	-0.0001**
lnassets	0.0017***	0.0008	0.0013**	0.0011*
business per employee	-0.0000***	-0.0000***	-0.0000***	-0.0000***
Profit per employee	0.0002***	0.0002***	0.0002***	0.0002***
ratio of net nonperforming advances to total advance	-0.0001**	-0.0001*	-0.0001	-0.0001*
Employee to deposits	0.3563***	0.2467**	0.1789*	0.5158***
ratio of priority advances to total advances	0	0	0	0
Capital adequacy	0	-0.0000**	0	0
Private domestic	0.0062***	0.0049**	0.0052***	0.0053**
Private foreign	0.0171***	0.0139***	0.0149***	0.0158***
Advances growth	-0.0001			-0.0006
ratio of interest income to total assets		-0.0004***		-0.0007***
advances to total assets			0.0056*	0.0071*
Constant	-0.0183**	-0.0004	-0.0125	-0.0072
N	505	594	594	505

Source: CMIE, RBI

Table 5d: Regression on Burden to Total Assets and Burden to Interest Income

Burden to Total Assets<sub>t,i</sub> =  $\alpha + \beta_1(\text{return on equity}_{t,i}) + \beta_2(\ln \text{ assets}_{t,i}) + \beta_3(\text{business per employee}_{t,i}) + \beta_4(\text{profit per employee}_{t,i}) + \beta_5(\text{ratio of net non performing advances}_{t,i}) + \beta_6(\text{employee deposits}_{t,i}) + \beta_7(\text{private domestic}_{t,i}) + \beta_8(\text{private foreign}_{t,i})$

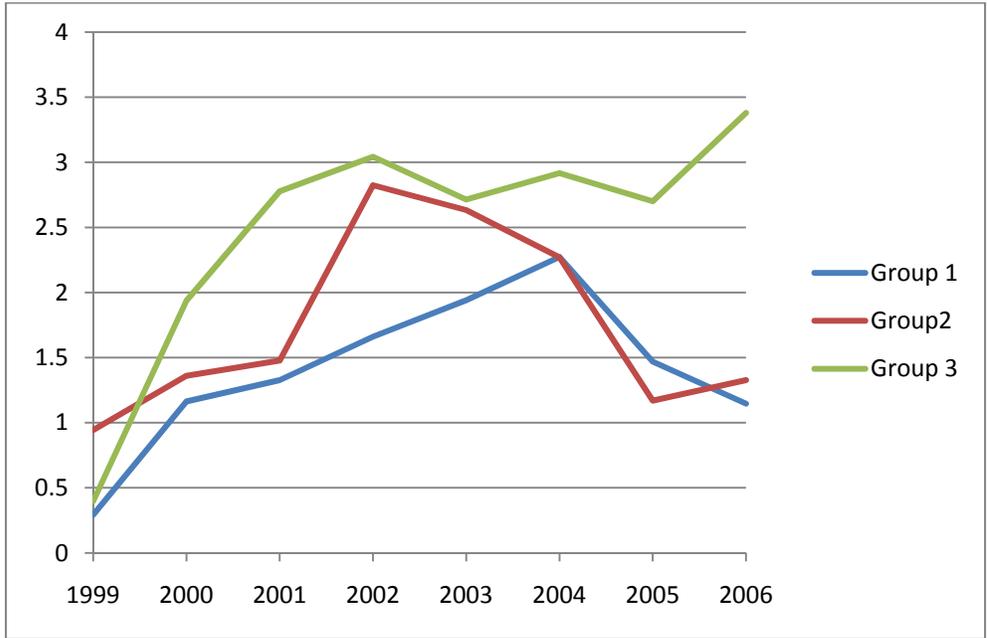
Burden to Interest Income <sub>t,i</sub> =  $\alpha + \beta_1(\text{return on equity}_{t,i}) + \beta_2(\ln \text{ assets}_{t,i}) + \beta_3(\text{business per employee}_{t,i}) + \beta_4(\text{profit per employee}_{t,i}) + \beta_5(\text{ratio of net non performing advances}_{t,i}) + \beta_6(\text{employee deposits}_{t,i}) + \beta_7(\text{private domestic}_{t,i}) + \beta_8(\text{private foreign}_{t,i})$

Dependent Variable	Regression 1: Burden to Assets ratio	Regression 2: Burden to Interest Income ratio
return on equity	-0.0105***	-0.0196
lnassets	-0.1235	-2.094
business per employee	0.0003**	0.0111***
profit per employee	-0.0057***	-0.2426***
ratio of net non performing advances	-0.0025	-0.0701
employee deposits	35.4474***	451.3502***
Private domestic	-0.561	-7.626
Private foreign	-0.8383	-17.7883**
Constant	2.7017*	37.3238
N	782	782

Source: CMIE, RBI

**Figure 1**

Non Interest Income to Working Funds



Non Interest Income to Total Assets

